

# **UCL**

# **Rapa Nui Landscapes of Construction**

# **Project**

*2008–18*

*Summary and Suggestions for Future Work*



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# UCL Rapa Nui Landscapes of Construction Project 2008–18

## Summary and suggestions for future work

### 1. Summary

The Rapa Nui Landscapes of Construction Project (LOC)'s aim was to investigate the construction activities associated with the Island's prehistoric statues and architecture as an *integrated whole*. These construction activities, which include quarrying, the moving and setting up of the statues, the building of *ahu*, and a range of settlement- and agriculture-related features (*hare moa*, *hare paepa*, *manavai*, rock gardens, *umu* etc.) were considered in the survey and subsequent analyses in terms of island-wide resources, social organisation and ideology. The work conducted included integrated aerial (kite and drone) and general field survey, geological and geomorphological survey and conservation (chemical weathering and physical erosion) survey, 3-D photography, photogrammetry and excavation. Many of the results have already been published in interim form—online on *Academia*, the *Internet Archive* and *Research Gate*, and in peer-reviewed book chapters and journal articles, and LOC is currently working on a final book of the project.

LOC is interested in reconstructing the past of the island, but also contributing to the 'living archaeology' of the present-day community, for whom it is an integral part of their identity, and in wider heritage management. Throughout the project, we have worked with and drawn on elements of the Rapanui community, from local archaeology students to Island elders, to provide training and help in recording, investigating and conserving the Island's archaeological past. On the Island, LOC additionally has worked in close cooperation with the *Corporación Nacional Forestal (CONAF)*, Rapa Nui, the *Museo Antropológico P. Sebastián Englert (MAPSE)* and the *Secretaría Técnica de Patrimonio, Rapa Nui (STP/ CMN)*. Fieldwork was undertaken under a permit issued by the *Consejo de Monumentos Nacionales, Chile* (ORN No 1699 CARTA 720 DEL 31 del 01.2008).



### 3. Project expertise

The UCL Institute of Archaeology is the largest archaeology institute in the world and employs specialists in a wide range of archaeology-related fields: environmental archaeology, excavation, geoarchaeology, GIS (and computer science generally), geophysics, heritage management, phenomenology, photogrammetry etc. It has exceptional facilities including world class Archaeological Science laboratories and a GIS laboratory. In addition to UCL staff and facilities, LOC has drawn on the specialists and expertise of a number of other universities and archaeological companies: in the UK, AerialCam (archaeological photography), Bournemouth University (geophysics), the University of Cambridge (soil micromorphology), the University of the Highlands and Islands (geophysics, excavation), the University of Manchester (excavation and post processual archaeology) and the University of Southampton (palynology); in Sydney Australia, The Australian Museum (obsidian usewear and residue analysis); and in the United States, Diffusion Laboratory, Virginia Commonwealth University, Richmond, VA (obsidian hydration dating). In addition the LOC team has acquired a wide-range of Rapa Nui specific experience/ knowledge of archaeological features, geology, geomorphology, the names and locations of sites and topography, which—in our view—uniquely qualifies LOC for work on the Island.

### 4. Projects

LOC has researched a range of different aspects of Rapa Nui's archaeology in widely separated locations on the island. The main foci of our research have been: *ahu* landscapes (the archaeological sites and topographic places associated with *ahu*), the *Ara Moai*, the eye petroglyphs of Rano Raraku, survey on the Poike peninsular and Puna Pau. As part of these surveys, LOC also conducted detailed studies of *hare paenga*, *moai* weathering, *pukao* and the wider use red scoria and other stone types in construction.

**AHU AND AHU LANDSCAPES.** From 2008–2010 formal walkover survey was conducted on *ahu* landscapes—areas of the landscape near, overseen or in someway influenced by *ahu*—in 18 parts of the island. *Ahu* landscapes were also looked at during the *Ara Moai* and Poike surveys. One of the aims of these surveys was to map the evidence for and consider the implications of the stone and quarries used in the construction of *ahu*, and we compared and contrasted the evidence for the use of stone from the proximate landscape with that for stone transported over longer distances that was used for special purposes. We also recorded the presence of other structures and features (including *hare moa*, *hare paenga*, *manavai*, rock gardens, *umu*, obsidian working locations and caves), and studied the topographic and sensory relationships between these and the *ahu*. This mapping of features located close to and far from individual *ahu* respectively, allowed us clearly to define the nature of the *ahu* landscape. 87 *ahu* were visited. An interim report (in English) on this work was submitted to CONAF and MAPSE in 2009 ([LOC 2009a](#)), and reproduced in Spanish in 2012 ([LOC 2012a](#)), and the survey has been drawn on for both book chapters ([Hamilton 2010; 2016](#)) and journal articles ([Hamilton 2008; Hamilton et al. 2011; Seager Thomas 2014](#)). Work on two databases, one on *ahu* structure and *ahu* relationships, and one on inter *ahu* zones, and the interpretation of these, is currently underway. In 2017, in order to assist STP Rapa Nui in identifying *ahu* conservation priorities, we extracted a list of *ahu* from our



work, correlated with *ahu* included in the *U de C Atlas Arqueológico*, and listed by P. Sebastian Englert and Helena Martinsson-Wallin, and detailed the degree and the nature of the threats to them ([Hamilton & Seager Thomas 2017](#)).



**Figure 1**

*Ahu Ura Uranga te Mahina (LOC SA9) showing the ahu (to the left of the picture), the plaza area — respected by a rock garden in the foreground, a small, so-called transit moai, and adjacent to this a line of crags running inland from the coast on which several crematoria are located. The linear feature running across the middle of the picture is the Island old road repalced in the 1990s. All of these features were mapped by LOC between 2008 and 2009. Photo: MST*

THE ARA MOAI. In 2009–10, and 2013–15, aerial (drone) and general field survey and geophysical survey were carried out along a c. 100 m wide transect straddling the southern *Ara Moai* between Rano Raraku and Ahu Hanga Tetenga and the northern *Ara Moai* between Rano Raraku and Maunga Anamarama. Field survey and geophysical survey was also conducted along short stretches of the middle *Ara Moai* in and to the east of Vaitea. The aim of this work was to obtain data that would inform our understanding of the form and nature of the *Ara Moai* and their relationship to the landscapes in which they are situated. We sought data that would assist CONAF in the creation of a walking route along the *Ara Moai*—what conservation measures were desirable, where information boards might be located etc. Geophysical surveys were conducted in c. 20 locations and details of the structure, distribution, spatial and landscape relationships, preservation and archaeological importance of c. 250 individual features recorded. These included *ahu*, *hare paenga*, *manavai*, *moai*, obsidian working locations, *umu* etc. Four interim reports were produced on this work ([LOC 2010](#) in English; and [LOC 2012a](#), [2013a](#), [2014a](#) and [2015](#) in English and Spanish), which were submitted to CONAF, MAPSE and the CMN. The LOC *Ara Moai* survey is also considered in [Hamilton 2013](#).



**Figure 2**

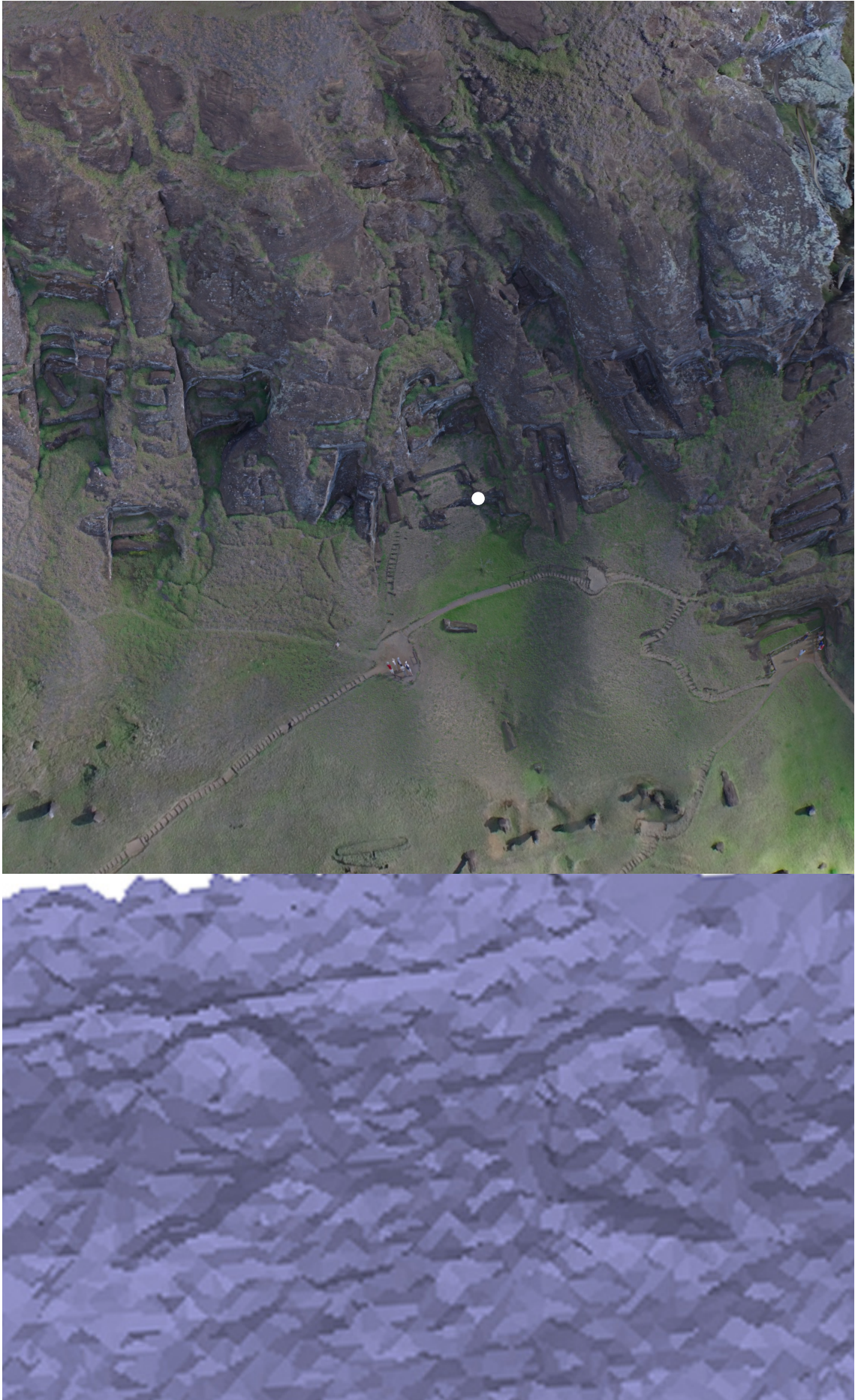
*LOC AMS23. Crescentic poro pavement recorded by LOC in 2013 during the Ara Moai survey. Photo: MST*

**EYE PETROGLYTHS AT RANO RARAKU.** At the request of *CONAF*, between 2013 and 2014 we surveyed the eye petroglyphs of Rano Raraku. Our objective in conducting this work was to identify any locational trends, which might assist in their interpretation, and contribute to a wider understanding of Rapa Nui quarrying (we had already identified a pair of eye petroglyphs at Puna Pau). *CONAF*'s interest was an accessible record of where the eyes were located and a study of their conservation—their condition, the threats to them etc. Visual identification and description of the eyes was aided by 3-D photographic modelling of the identified petroglyphs and selected 3-D models of likely petroglyph locations (which identified one additional eye). In order better to locate the eyes we also produced a 3-D photogrammetric model of the whole quarry and a series of orthophotographs from which we are currently preparing a new scaled plan of the site. 29 eye petroglyphs and 14 other petroglyphs were identified and recorded. Full English and Spanish reports on this work were published in 2014 ([LOC 2014b](#)), and it is discussed in [Hamilton 2013](#).

**Figure 3**

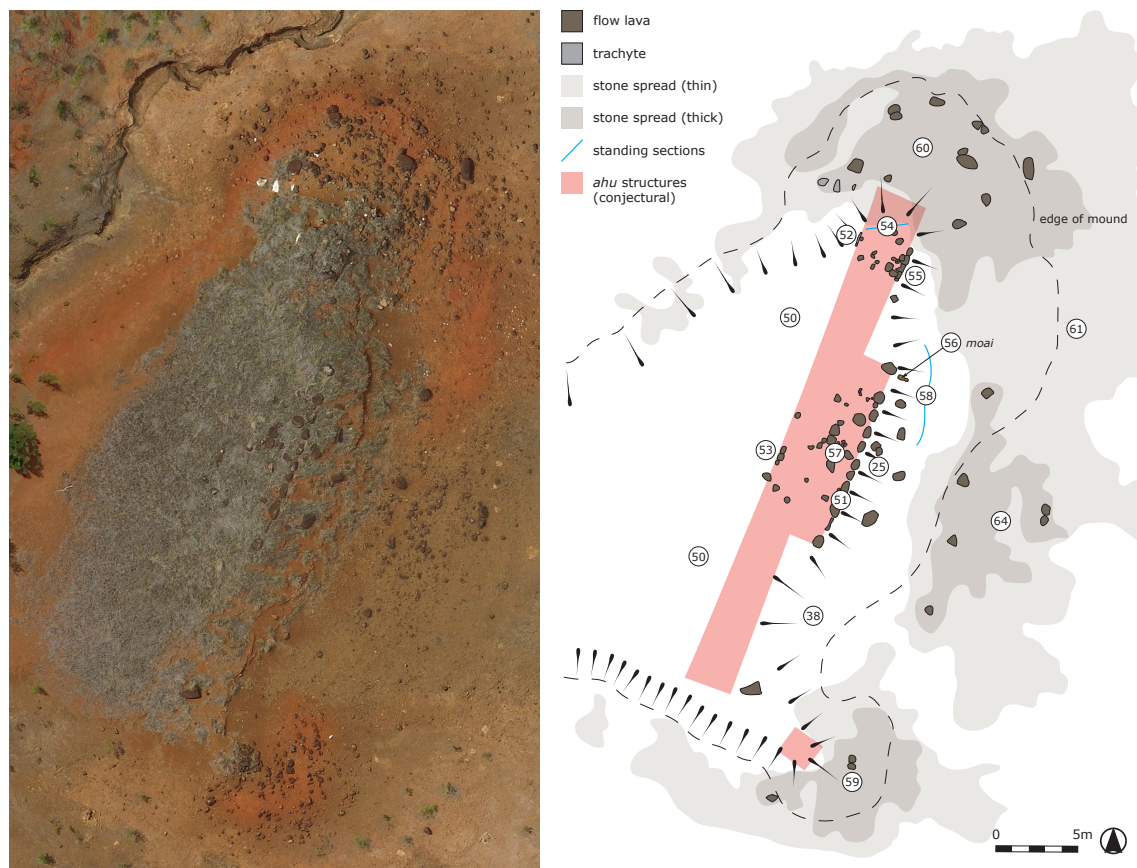
*Between 2013 and 2014 LOC recorded 29 eye petroglyphs at Rano Raraku. The following year it recorded the quarry photogrammetrically, and it is currently preparing a scaled plan of the site from the photographs. Top: orthophotograph of part of the exterior quarry showing the location of eye petroglyph LOC E07. Bottom 3-D photograph of eye petroglyph LOC E07. The left-hand eye is clearly visible in the field; the right hand eye was only identified from the 3-D photograph model made of them. Photos: Adam Stanford*







POIKE. Between 2015 and 2016 at the request of the *STP Rapa Nui* we conducted trial integrated aerial/ field survey on two 500 x 500 m survey squares at the heavily weathered eastern end of the Poike peninsular. For LOC, this represented a continuation of the *ahu* and *ahu* landscapes survey described above and complemented and provided a comparison—in a different Rapa Nui environment—for the landscapes recorded by us during this and the *Ara Moai* survey. For the *STP*, it provided data on the conservation of the two survey squares and in particular two threatened *ahu*, and an example of how a survey of Poike as a whole could be approached. As a result of this survey, LOC recommended that environmental sampling be conducted on several exposed sections on the two *ahu*, and this was carried out (on one of the *ahu*) the following year (LOC 2017). A full report on the survey in English and Spanish was completed in 2016 (LOC 2016). A report on the environmental sampling is currently in preparation.

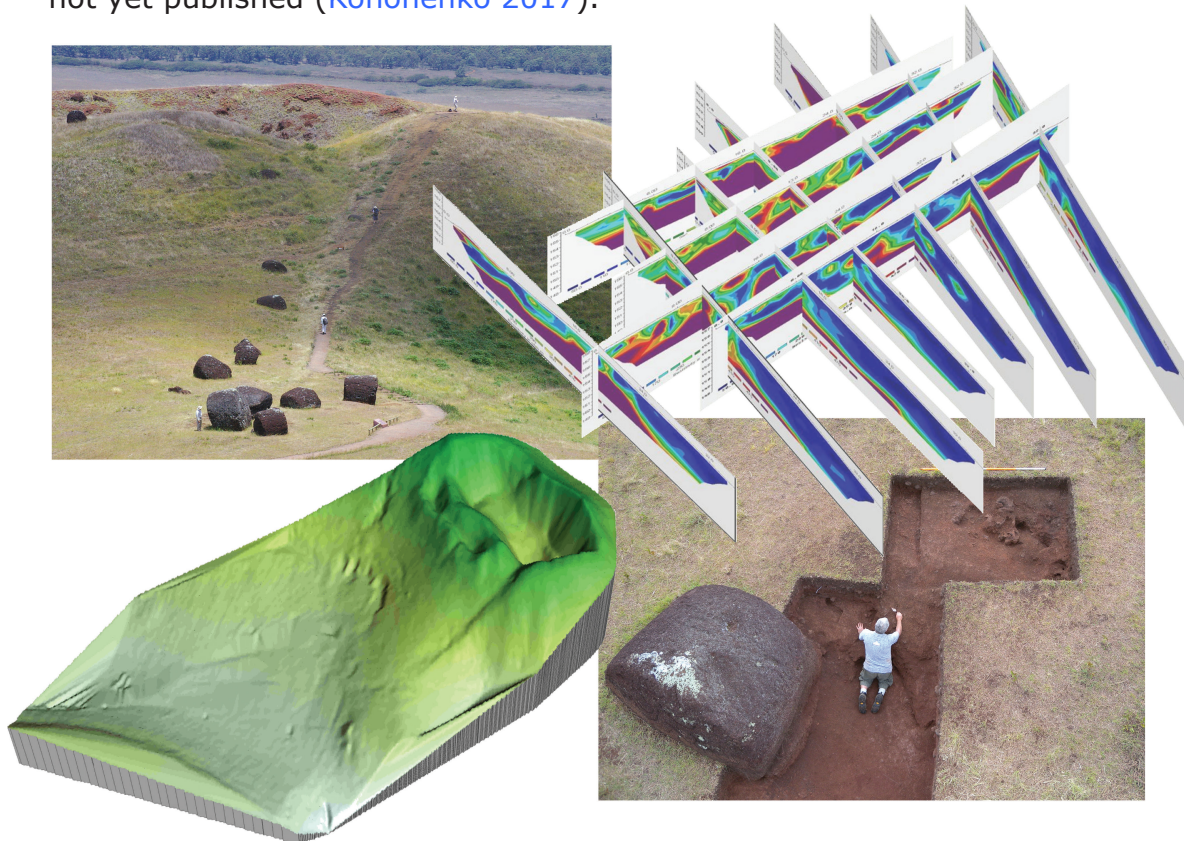


**Figure 4**

*The LOC Poike survey. LOC surveyed two 500x500m squares on Poike. The aerial photograph to the left shows Ahu Hati to Kohe. The interpretative plan to the right integrates data from this photo and data collected on the ground. Photo: Adam Stanford; plan: MST*

PUNA PAU. LOC carried out geophysical survey and excavation on the outside (2008–9) and on the inside of Puna Pau crater (2012–13) in order to improve our understanding of quarry organization and dating. Soil micromorphological and pollen analyses were carried out on samples taken from both sites. In addition, usewear analysis was carried out on obsidian recovered during the excavations inside the crater (50 pieces, including three broken *mata'a*), a number of obsidian hydration dates obtained, and a large assemblage of

obsidian and other stone tools and debitage studied (morphologically and geologically). The results of the geophysical surveys, excavations, stone tool analysis and obsidian hydration dating have been published in interim form in English and Spanish ([LOC 2008](#); [2009b](#); [2012b](#); [2012b](#); [2013b](#); [2015](#)), and the Puna Pau project as a whole is addressed in two articles by Hamilton ([2008](#); [2013](#)), and in order to assist CONAF in its presentation of the site, we have produced a synthetic report on the site ([Richards 2014](#)). The analysis of and reports on the environmental analyses ([French 2017](#); [Scaife ND](#)) and the study of obsidian usewear and residue analysis have been completed but are not yet published ([Kononenko 2017](#)).



**Figure 5**

*Fieldwork at Puna Pau. Clockwise from top left: exterior of the Puna Pau crater, with the line of pukao marking the main route out of the quarry (photo: MST); tomography analysis of the exterior of Puna Pau (Susan Ovenden); excavation of a pukao and associated 'road surface' on the exterior of Puna Pau (photo: Adam Stanford); and laser scanned topography of Puna Pau (Kate Welham)*

**HARE PAENĀ.** Formal survey of *hare paenā* was not conducted but in 2009 a recording prompt sheet for these was designed for use by local school children (of teen age), which would inform our research on island-wide resources, social organisation and ideology, and introduce the children to archaeological recording, local geology (the survey involved matching the stones used in the *hare paenā* with those in the landscape) in English and Spanish (the prompt sheet was bilingual). The idea was not taken up locally, but several trial surveys were undertaken and the prompt sheet subsequently used during LOC's *ahu* and *Ara Moai* surveys. Details of the locations, size, preservation, structure, geology, landscape setting, structural associations etc., of over 100 *hare paenā* were recorded. Work on a database drawn from these and the interpretation of this is currently underway. This data is drawn on for [Hamilton & Richards 2016](#) and [Seager Thomas 2014](#).



**MOAI WEATHERING.** As part of the *Ara Moai* survey, between 2014 and 2015, LOC studied the chemical and physical weathering of recumbent *moai* along the three *Ara Moai* (35 *moai*), and of recumbent and upstanding *moai* at Rano Raraku (12 *moai*). The main purpose of this was to provide a comparative database of *moai* weathering for statues already recorded by CONAF at Rano Raraku (2012) and so assist it in identifying conservation priorities. To this end 3-D photographic models were created of *all* the *moai* within our survey area along the *Ara Moai*. In addition, LOC was interested in whether it was possible to infer anything of former *moai* position, whether they were originally standing or recumbent, from their weathering, to which end we conducted a detailed study of the weathering of their downward (i.e. currently protected)



**Figure 6**

*Differential weathering of prone moai on the Ara Moai. Note the unweathered lower eye and chin and the heavily weathered upper cheek and upper chest of the moai in the lower two photographs. These show that this moai was formerly standing. LOC surveyed 35 recumbent moai along the Ara Moai. Photos: MST*

surfaces. The preliminary results of this work, which show that most of the recumbent *moai* studied were formerly standing, are discussed in [LOC 2014a](#). A final report integrating these results with the results of the work on *moai* location on the *Ara Moai* referred to above has been written but is not yet published ([Hamilton & Seager Thomas forthcoming](#)).

**PUKAO AND OTHER RED SCORIA.** In order more completely to characterize the meaning of quarrying at Puna Pau, LOC conducted an Island-wide survey of the use and re-use of red scoria, both from Puna Pau and elsewhere.

For this a number of different scoria variants were distinguished and the different distributions and uses of these for *pukao*, *ahu* fascia blocks, *pu paenga*, as granules in funerary deposits etc. (both on individual sites and in the wider landscape) identified and quantified. 96 *pukao* were plotted (where approachable, all of Puna Pau red scoria) and many hundreds of other occurrences. An interim report in English on this work (LOC 2009) was republished in Spanish in 2012 (LOC 2012a) and it provided the principal source of data for Seager Thomas 2014.

### 5. Local involvement

Throughout the project, we have involved and engaged the local community. To this end, we have for many years employed/ were assisted by Rapanui archaeology students (2010: Tikitehatu Astete [Tiki Paoa]; 2012–13: Isaias Hey Gonzalez, Francisca Pakomio Villanueva, Joaquin Soler Hotu; 2015:



**Figure 7**

*Rapanui archaeology student Fran Pakomio planning a stone feature excavated during LOC's 2012 excavations at Puna Pau. Photo: Adam Stanford*

Moana Gorman Edwards; 2016: Isaias Hey Gonzalez), and in 2012 we were able to provide a bursary (*beca*) for Francisca Pakomio to attend the UCL Institute of Archaeology Field Training Course in the UK (Hamilton 2013). In 2015 we employed Christian Veri Veri to assist with our geophysical surveys. In 2015 we also field taught the local school children the use of geophysics in archaeology (LOC 2015b). In recent years we have also usually been accompanied by CONAF rangers (Julio Haoa Avaka, Cristopher Ahsoun Tuki, Paulo Tepano), with whom we consulted, and trained in in our methods. We also consulted with a number of Rapanui elders, the late Sorababel Fati Teao, whom we employed as Supervisor on the Puna Pau excavations, Edmundo



Pont, with whom we discussed rock art at Rano Raraku (LOC 2014b) and Sonia Haoa, with whom we collaborated during the Poike Survey (LOC 2016; 2017).

On the Island, LOC has presented talks annually to the CONAF rangers, and in 2014 we exhibited our work at the Tonjariki Cultural Centre. We have given several public lectures at MAPSE.

## 6. Results/ dissemination

From the start, LOC has relied on the generosity of the Rapanui community, which has allowed us to work on its heritage, and built upon the surveys and ideas of other workers. In order to repay this debt, we have endeavoured to make the results of our work available at the earliest possible opportunity. Our early interim reports (LOC1–8) were written on the Island and submitted to CMN, CONAF and MAPSE at the end of each field season. These suffered, however, from lack of time available to us and for this reason later reports (LOC9–11 and 13) were written in the months immediately following each year's field season but in every case submitted before the end of the year. These reports come with databases of the finds made and details of the applications made and the permits granted. All of these—including the databases—have been posted online (on *Academia*, the *Internet Archive* and/or *Researchgate*). Additionally, 15 peer-reviewed book chapters and articles on the project have been published, and others written but not yet published. A final book of the project (scheduled for publication in 2020) is currently in preparation.

## 7. Future work and UCL's hoped for collaboration with Ma'a Huenia and the STP

As noted above, LOC's wide Rapa Nui specific knowledge/ experience uniquely qualifies it to work on the Island, and it is keen fully to realize the potential of this, in terms of the development and dissemination of Rapa Nui archaeology generally, and also its own skills and research interests. Obvious future projects to which LOC could usefully contribute include: 1) a continuation of the Poike survey, the aims of this being to record and provide data, which would assist in the conservation of the peninsula's archaeology, and to provide a database against which material generated by LOC elsewhere on the Island can be compared; 2) an *ahu* conservation survey, in which *ahu* and *ahu* landscapes identified as under threat, are surveyed using the methods already applied by LOC to threatened *ahu* on Poike; 3) the design of Rapa Nui-specific feature recording protocols for these surveys and a wider survey of the Island, similar to that already trialled for *hare paenga* (an understudied feature category of interest to LOC would be *taheta*, but specific protocols could and should—in our view—be prepared for all types of Rapa Nui archaeological features); and 4) provision of support for the creation of an integrated Island database and GIS platform.

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